

Household Consumption Patterns in Pakistan: An Urban-Rural Comparison Using Micro Data

NADEEM A. BURNEY and ASHFAQUE H. KHAN

This paper examines the household consumption patterns separately for the urban and the rural sectors in Pakistan by estimating the marginal expenditure shares and expenditure elasticities, for twelve broad commodity groups, using household level data for the year 1984-85. At the sectoral level, the marginal expenditure shares are estimated both with and without the 'community effect'. Furthermore, by dividing households within each sector into different income groups, income-specific marginal expenditure shares and elasticities are also obtained. This level of disaggregation reveals much richer consumption patterns as compared to the ones based on grouped data.

The estimated marginal expenditure shares indicate that in examining the household consumption patterns one can safely assume that all the households in the sample face the same price structure. While the findings of the paper support the validity of Engel's Law, the estimates presented indicate that expenditure elasticities for different commodity groups vary with income and, in general, exhibit a cyclical pattern, which is explained in terms of quantitative as well as qualitative changes in the households' consumption basket. For a majority of the commodity groups, both structural and behavioural differences in the consumption patterns are found to exist between the urban and the rural households. Furthermore, our results also confirm the existence of economies of scale in the consumption of majority of the commodity groups. The degrees of these economies of scale are not only different across commodities but also between sectors and across the income groups within each sector.

I. INTRODUCTION

The consumption patterns of households in Pakistan have been analyzed in a number of studies.¹ These studies differ not only in their scope but also by the source and the period of the data. While most of the studies have used the cross-

Nadeem A. Burney and Ashfaque H. Khan are both Chief of Research in the Pakistan Institute of Development Economics.

Authors' Note: We would like to express our gratitude to Professor Syed Nawab Haider Naqvi, Director, Pakistan Institute of Development Economics, for his constant encouragement and for help in getting the data tape from the Statistics Division. The helpful comments made by an anonymous referee of the journal on earlier drafts of the paper are gratefully acknowledged. We are also thankful to Ali Shan Ahmad for his valuable assistance with the programming to prepare the data files. We alone are responsible for any remaining errors.

¹See, for example, Ranis (1961); Rahman (1963); Bussink (1970); Khan (1970); Ali (1981, 1985); Malik (1982); Mukhtar (1985); Cheema and Malik (1985); Malik and Ahmad (1985); Malik *et al.* (1987, 1988); Ahmad and Ludlow (1987); Ahmad *et al.* (1988); Alderman (1988); and Burney and Khan (1991).

section data reported in the Household Income and Expenditure Surveys (HIES), the analyses in a majority of them are based on the single equation estimates.² The main objective of these studies has been to estimate and test the validity of the relationship between income and expenditure on different commodities, as summarized by Engel's law.^{3,4} Furthermore, in order to examine the impact of urbanization on the households' consumption patterns, these studies have obtained separate estimates for the urban and the rural sectors. Some of the studies, e.g., Ali (1981) and Siddiqui (1982), have also tested for the existence of economies of scale in consumption. The findings of these studies are in conformity with Engel's law. Furthermore, the consumption patterns in the urban sector are found to be considerably different from that in the rural sector. The estimates also point to the existence of economies of scale in the consumption of certain commodities.

With the exception of Malik and Ahmad (1985) and Malik *et al.* (1987), these studies are based exclusively on data which are at least a decade old. Furthermore, in the estimation of the relationship between income and expenditure on different commodities, these studies have used grouped data to obtain marginal propensities to consume (marginal expenditure shares) and income (expenditure) elasticities. As the use of the grouped data ignores variations in income and expenditure within a group, the estimates obtained are at best average expenditure shares and elasticities. They are, thus, not likely to reflect the true consumption patterns accurately. The consumption patterns are likely to have changed considerably since the late seventies; as such, there is a need to analyze the households' consumption patterns on the basis of more recent micro data.

The purpose of this study is manifold. First, it analyses the households' consumption patterns in Pakistan by estimating marginal expenditure shares and expenditure elasticities using household level micro data for the year 1984-85. Second, it examines the impact of urbanization by obtaining separate estimates for the urban and the rural sectors. Third, we take this study down to different income

²Mukhtar (1985); Ahmad and Ludlow (1987); Ahmad *et al.* (1988); Ali (1985) and Alderman (1988) have used the systems approach to analyse the households' consumption behaviour in Pakistan. The first three studies have estimated a Linear Expenditure System (LES), whereas the last two have estimated Extended Linear Expenditure System (ELES) and Almost Ideal Demand System (AIDS), respectively.

³According to Engel's law, as income rises the share of expenditure on Food in total households' expenditure declines, but that of Clothing, fuel and Lighting remains constant, and that of luxury goods increases. See Stigler (1954); Thomas (1986) and Lipton (1988) have shown that at a very low level of income Engel's law does not hold; i.e., the marginal expenditure share for Food increases with the level of income.

⁴As the objective of this study is to examine the relationship defined by Engel's law, in the subsequent discussion reference will be made only to studies which are based on the single equation estimates.

groups to get income-specific expenditure shares and elasticities for both the urban and the rural sectors. This has been done to highlight differences in the consumption patterns of households in different income groups within each sector. To accomplish this, households in each sector are divided into six income groups.⁵ As it will become clear later, this level of disaggregation reveals much richer consumption patterns as compared to the ones based on grouped data.⁶ Fourth, it measures the economies-of-scale effect in household consumption by including the household-size as an explanatory variable in Engel's curve equation.⁷ Finally, this study seeks to establish the existence of structural and/or behavioural differences in the consumption patterns of the urban and the rural households.⁸

The plan of the paper is as follows: Section II discusses the methodology while the data are discussed in Section III. Results are reported and discussed in Section IV. The final section contains the concluding remarks.

II. THEORETICAL FRAMEWORK

To test the validity of Engel's law for Pakistan, we analyze the consumption patterns by estimating expenditure shares and expenditure elasticities. The Engel curve is a demand function derived from constrained utility maximization, which is specified as:

$$x_i = a_i + b_i(p_j/p_i) + c_i(Y/p_i) + e_i \dots \dots \dots (1)$$

where x_i is the demand of commodity i , p_j/p_i is the relative price, Y/p_i is the real income and e_i represents a random error. The relationship between expenditure on commodity i and income can be derived as follows:

$$p_i x_i = a_i p_i + b_i p_j + c_i Y + e_i p_i \dots \dots \dots (2)$$

⁵For a detailed explanation about the selection of groups, see Burney and Khan (1991).

⁶Malik *et al.* (1987) have used 1984-85 HIES to obtain marginal propensities to spend. Their estimates are, however, based on grouped data and are considerably different from those reported here in Section IV. Our estimates also differ from all the previous estimates obtained by using grouped data. For a detailed comparison of the results, see Section IV.

⁷An alternative and more sophisticated way to measure the economies of scale effect is to use what is commonly known in the literature as the adult equivalent scale, which is an index of the households' composition. For a detailed discussion on the topic and the problems in their estimation, see Brown and Deaton (1972) and Deaton and Muellbauer (1980), Ch. 8. Because of the statistical problems in the estimation, few studies have attempted to estimate Engel curves with the adult equivalent scales. In this study, therefore, we restrict our analysis to the use of household-size for measuring the economies-of-scale effect in household consumption.

⁸The structural difference between the consumption patterns of the urban and the rural households is taken as the difference in the intercepts, whereas difference in the slopes is considered to indicate behavioural differences. See Johnston (1986), Ch. 6.

In most empirical studies on the households' consumption patterns, which are based on a single year cross-section data, it has been customary to assume that for every commodity all the households face the same prices. There is, however, a growing evidence which suggests that the manner in which most household budget surveys are conducted, this assumption is hardly true.⁹ In general, such surveys collect data on clusters of households that live together in the same village and are surveyed at the same time. While all the households living within the same cluster face the same market prices, the prices are not the same across clusters because of the difference in the transportation cost. As, typically, the household budget surveys do not provide information on market prices, it is difficult to capture the impact of price variation on consumption patterns. Recently, Deaton (1988) has suggested a method to take account of the impact on consumption of spatial variation in prices. The method, however, can only be applied to cases where the commodities being considered are specific and homogeneous in nature and *not* broad groups as in our paper. An alternative procedure of controlling for prices, under the assumption that all the households within the community face the same price structure, is to estimate the relation by redefining all the variables in the form of deviations from their respective community means.¹⁰

Assuming that for every commodity all the households face the same price,¹¹ Equation (2) can then be rewritten as:

$$E_i = \alpha_i + \beta_i Y + u_i \quad \dots \quad \dots \quad \dots \quad \dots \quad (3)$$

where $E_i = p_i x_i$, $\alpha_i = a_i p_i + b_i p_j$, $\beta_i = c_i$, $u_i = e_i p_i$. Equation (3) states the relationship between the households' expenditure on commodity i (E_i) and income (Y), which is exactly what the Engel curve represents.

In empirical studies based on grouped data, it is common practice to assume that there is a single utility function for all the households within each income group, and that preference ordering does not change across families. This, however, is a strong assumption because preference ordering may change from one income class to another, or even from one family to another. In this paper, it is being assumed that all the households have the same utility function. However, since the study is based on household level data and the households' consumption is influenced by a host of factors, including the household composition and the individuals'

⁹See, for example, Alderman (1986); Deaton (1988); and Behrman and Deolalikar (1990).

¹⁰This procedure was suggested by the referee.

¹¹It may be pointed out that since prices differ because of difference in the quality of the commodity, households consuming the same commodity of a different quality are likely to face different prices.

taste, similar households are likely to have different expenditure patterns. The fact that information on all the factors is usually not available, and that the estimated relation in general contains only two or at the most three factors, the stochastic term in the estimated relation captures the effects of other household/ individual specific information. This is likely to introduce a bias in the estimated parameter. The degree of bias, however, is unknown.

Since the Engel curve is a demand function derived from constrained utility maximization, it must satisfy general restrictions of the demand theory. When using cross-section data (as prices are assumed to be identical across households), the restrictions in terms of price derivatives such as homogeneity, symmetry, and negativity of the own-price effect cannot be tested. This leaves only the adding-up condition to be satisfied.¹² In terms of the parameters of Equation (3), the adding-up restriction implies that α_i and β_i must sum-up to zero and unity, respectively, i.e., $\Sigma\alpha_i = 0$ and $\Sigma\beta_i = 1$.

In estimating Engel's curve, the consumption of different commodities is usually taken in terms of expenditure rather than quantities, because of the problem of aggregation of heterogeneous items, and because expenditure takes care of the changes in both the quantity and the quality of the goods consumed.¹³

To test the validity of Engel's law, the choice of an appropriate functional form has been a matter of great interest. As such, various functional forms, e.g., linear, double-logarithmic, semi-logarithmic, etc., have been used.¹⁴ To-date, however, no functional form has found general acceptance. Since, *a priori*, it is difficult to determine which of the functional forms is the most appropriate to any particular data set, we choose linear and double-logarithmic forms because they have been used widely in the literature.¹⁵

In the empirical studies on consumption patterns, both measured (reported) income and permanent income have been used as the explanatory variable. Since permanent income is unobservable, it has been usually approximated by total household expenditure. Whereas the use of household income yields marginal propensities to consume and income elasticities, the use of total expenditure gives marginal expenditure shares and expenditure elasticities. The total household expenditure has been preferred over income as an explanatory variable because of the fact that income data generally suffers from measurement errors and may also include a transitory component of income. Thus, as stated in Friedman (1957), the

¹²See Johnson *et al.* (1984).

¹³See Houthakker (1957).

¹⁴For a detailed discussion on various functional forms of the Engel curve, see, for example, Bewley (1982); Aasness and Rodseth (1983); Giles and Hampton (1985) and Tansel (1986).

¹⁵Both linear and double-logarithmic functions have their own merits and demerits, which are well documented in Humphrey and Oxley (1976).

use of measured (reported) income instead of permanent income gives biased results. The total expenditure is also preferred when the objective is to investigate the differences in the tastes and preferences. For instance, in most empirical studies, the consumption patterns in the urban and the rural sectors are analyzed separately. Measured income in the rural sector is considered to be highly vulnerable to large fluctuation as compared with that in the urban sector due to the unpredictable nature of the agricultural activities. The differences in the income elasticities of the urban and the rural sectors, therefore, do not truly reflect differences in the tastes and preferences of the two sectors.¹⁶

Besides income/expenditure, explicit use of the household-size in the formulation of the Engel curve has been emphasized by Prais and Houthakker (1955) on the grounds that households' total expenditure and size are positively correlated, and if the latter is not treated explicitly, this may bias the results. Furthermore, the variations in the household-size have comparatively larger effects on the consumption of certain commodities than the variations in the total expenditure. The coefficient of the household-size captures the effect of economies of scale in consumption among larger households.¹⁷ Houthakker (1957) has pointed out that the coefficient of the household-size represents a combination of two effects, viz., the 'specific effect' and the 'income effect'. The 'specific effect' refers to the effect resulting from an increase in the need for various commodities when the household-size increases. The increase in need is, however, usually less than proportional to the increase in the household-size because of 'economies of scale' in the large households. The 'income effect' refers to the effect when an increase in the household-size makes the family relatively poorer in per capita income terms. If the 'specific effect' dominates the 'income effect', the coefficient of the household-size is positive; and negative otherwise.

In this study, we use total household expenditure instead of income and the household-size as the explanatory variables. Equation (3) can then be written in the linear and the double-logarithmic forms as follows:

$$E_{ij}^{lq} = \alpha_{ij}^q + \beta_{ij}^q E_j^{lq} + \gamma_{ij}^q HS_j^{lq} \quad \dots \quad \dots \quad \dots \quad (4)$$

¹⁶The income and expenditure elasticities are equivalent only if the proportion of income that the households save remains constant over time. See Humphery and Oxley (1976).

¹⁷Besides total expenditure and household size, other variables, like education, distribution of income and assets, the number of earners in a household, and the age and sex of the household members, are likely to affect the households' consumption behaviour. However, since the objective of this study is to examine the consumption patterns rather than behaviour, we focus only on total expenditure and household-size. Furthermore, Crockett (1967) has found that total expenditure and household size are the most important factors in determining the consumption patterns.

$$\ln E_{ij}^{lq} = \theta_{ij}^q + \lambda_{ij}^q \ln E_j^{lq} + \delta_{ij}^q \ln HS_j^{lq} \quad \dots \quad \dots \quad \dots \quad (5)$$

where $l = 1, 2, \dots, k$ households.

$q =$ urban, rural sectors.

$i = 1, 2, \dots, n$ commodity groups.

$j = 1, 2, \dots, m$ income groups.

$E_{ij}^{lq} =$ expenditure of l th household in j th income group on i th commodity (Rupees per month) in q th sector.

$E_j^{lq} =$ total expenditure of l th household in j th income group (Rupees per month) in q th sector.

$HS_j^{lq} =$ household-size of l th household in j th income group in q th sector.

$\beta_{ij}^q =$ expenditure share of i th commodity in total household expenditure of households in j th income group of sector q .

$\lambda_{ij}^q =$ expenditure elasticity of i th commodity with respect to total expenditure for household in j th income group of sector q .

$\gamma_{ij}^q =$ change in the expenditure on i th commodity of households' in j th income group of sector q with respect to household-size.

$\delta_{ij}^q =$ expenditure elasticity of i th commodity with respect to household-size for households in j th income group of sector q .

III. THE DATA

This study is based on the micro level data of the Household Income and Expenditure Survey (HIES) for the year 1984-85, compiled by the Statistics Division of the Government of Pakistan. This survey, based on a national sample, covered 16580 households. As the objective of the paper is to estimate income-specific expenditure shares and expenditure elasticities for the urban and the rural sectors separately, the households in each sector are divided into six income groups. The distribution of the households among different income groups is reported in Table 1.¹⁸

It is evident from the table that more than 54 percent of the households have a

¹⁸Table 1 accounts for 16499 households, i.e., 99.5 percent of the households covered in the survey. The differences of 81 households are treated as outliers and are excluded from the analysis because they include households with an income of more than Rs 15000.00 per month and/or households with more than 20 members.

Table 1

Distribution of Households among Different Income Groups, by Sector

Income Groups (Monthly Income in Rupees)	Sectors	Number of Households	Percentage of Households
I. ≤ 1000	Urban	1335	8.09
	Rural	3189	19.33
II. 1001 – 1500	Urban	1770	10.73
	Rural	2648	16.05
III. 1501 – 2000	Urban	1354	8.21
	Rural	1554	9.42
IV. 2001 – 3000	Urban	1509	9.15
	Rural	1103	6.69
V. 3001 – 5000	Urban	942	5.71
	Rural	435	2.64
VI. 5001 – 15000	Urban	506	3.07
	Rural	154	0.93
		<u>16499</u>	<u>100.00</u>

monthly income of upto Rs 1500.00. The disaggregation further reveals that more than 35 percent of the rural households and 19 percent of the urban households fall under this income bracket. This suggests that in analyzing the consumption patterns, particular attention should be given to the lower income groups.

The list of the commodities covered in the survey is quite comprehensive. For the purposes of this study, however, they have been grouped into twelve major categories, namely, Food and Drinks, Clothing and Footwear, Fuel and Lighting, Housing, Transport and Communications, Household Effects, Personal Effects, Health Care, Education, Entertainment, Durables, and Miscellaneous items. Household Effects include furniture, fixtures, crockery, and other such items of household use. Household appliances and valuables such as refrigerator, television, camera, car, and air-conditioner, which can be sold fairly easily, are taken as durables. The Miscellaneous category includes expenditure not specified, such as charity, transfer to other family members, and taxes.

For each one of the commodities included in the survey, the data tape contains separate information on the amount spent on purchase of the commodity

and imputed value of the self-produced and/or gifts received in kind. While a separate analysis of these two different types of expenses may provide a better and useful insight into the consumption patterns, the results are not likely to be different qualitatively. Thus, for the purposes of this study, we consider total expenditure, i.e., the amount spent on purchase of the commodities plus the imputed value of the self-produced and/or gifts received in kind.

The average expenditure shares of the twelve commodity groups for both the urban and the rural households, as well as for the households in different income groups within each sector, are reported in Table 2. It is to be noted that for the majority of the commodities, the expenditure shares are different between the two sectors. While the rural households spend proportionately more on Food and Drinks as compared with the urban households, they spend considerably less on Housing, Transport and Communication, Education, and Entertainment than their urban counterparts. The table further reveals that within a given sector, the expenditure shares not only vary considerably across different income groups but also exhibit certain patterns. For instance, the expenditure shares of Food and Drinks, Fuel and Lighting, Household Effects, and Health Care decline as the level of income increases for both the urban and the rural households. On the other hand, the expenditure shares of Housing, Transport and Communication, Education, Entertainment, Durables, and Miscellaneous items rise with the level of income.

IV. THE RESULTS

This section reports results on the consumption patterns in Pakistan based on the HIES for the year 1984-85. Both linear and double-logarithmic functional forms of the Engel's curve are estimated with the help of the Ordinary Least Square (OLS) method.¹⁹ In the first step for each sector, i.e., urban and rural, marginal expenditure shares are estimated, using the linear form of the Engel's curve under the alternative assumptions that (i) all the households in the sample face the same price structure, and (ii) the households only within a community/cluster face the same price structure while prices may vary across clusters. The estimated marginal expenditure shares with and without the 'community effects' are reported in Table 3. It is apparent from the table that, in general, the two sets of estimates are not much

¹⁹Prais and Houthakker (1955) have found in the family budget studies that the residual variance around the regression of consumption on income increased with the level of income. That is, the error terms are heteroscedastic. It is now generally assumed that in similar surveys one can expect unequal variances among the disturbances. In this study we use two functional forms, viz., linear and double-logarithmic functions. As the double-logarithmic form is likely to correct for heteroscedasticity, and the fact that the households are categorized into six income groups, the heteroscedasticity is likely to be less of a problem. In this study, however, the standard errors of the estimates reported were adjusted for the heteroscedasticity, using the technique suggested by White (1980, 1982).

Table 2
Average Expenditure Shares for Different Commodities, by Sector and Income Group

Commodities	Sectors	Overall	Income Groups					
			I <1000	II 1001-1500	III 1501-2000	IV 2001-3000	V 3001-5000	VI 5001-15000
Food and Drinks	Urban	44.00	52.30	50.79	48.68	47.07	42.24	33.20
	Rural	51.46	55.26	54.67	53.23	51.78	45.77	36.13
Clothing and Footwear	Urban	6.30	6.95	7.03	7.10	6.82	6.01	4.98
	Rural	7.14	7.73	7.60	7.38	7.14	6.09	5.37
Fuel and Lighting	Urban	4.93	7.08	6.40	5.74	5.16	4.26	3.26
	Rural	5.93	7.08	6.42	6.05	5.53	4.91	3.79
Housing	Urban	16.76	14.39	14.61	15.06	14.83	17.57	21.63
	Rural	8.10	9.24	8.04	7.64	7.21	7.82	10.63
Transport and Commu.	Urban	4.58	2.00	2.49	2.98	3.80	4.62	7.55
	Rural	2.94	2.25	2.39	2.53	2.86	3.53	6.54
Household Effects	Urban	3.08	3.47	3.38	3.27	3.24	2.97	2.65
	Rural	3.66	3.87	3.68	3.74	3.73	3.29	3.26
Personal Effects	Urban	4.28	4.19	4.31	4.10	4.35	4.36	4.45
	Rural	4.09	3.88	3.84	3.95	4.25	4.57	4.72
Health Care	Urban	2.23	2.52	2.47	2.37	2.30	2.16	1.93
	Rural	2.43	2.57	2.44	2.31	2.45	2.36	2.74
Education	Urban	1.67	0.46	0.72	1.28	1.64	2.15	2.52
	Rural	0.59	0.25	0.47	0.59	0.72	0.91	1.14

Continued -

Table 2 - (Continued)

Entertainment	Urban	1.01	0.44	0.56	0.71	0.89	1.24	1.64
	Rural	0.48	0.24	0.30	0.42	0.44	0.59	0.92
Durables	Urban	1.63	0.49	0.64	1.18	1.28	1.86	2.88
	Rural	1.33	0.47	0.63	0.81	1.25	1.63	4.09
Miscellaneous	Urban	9.06	5.65	6.47	7.37	8.44	10.10	12.02
	Rural	11.71	7.07	9.41	11.21	12.45	18.37	20.36
Total	Urban	99.53	99.94	99.87	99.84	99.82	99.54	98.71
	Rural	99.86	99.91	99.89	99.86	99.81	99.85	99.69

Table 3

Marginal Expenditure Shares for Different Commodities, with and without Community Effects, by Sector

	With Community Effects		Without Community Effects	
	Urban	Rural	Urban	Rural
Food and Drinks	0.260	0.264	0.264	0.301
Clothing and Footwear	0.039	0.035	0.041	0.039
Fuel and Lighting	0.021	0.021	0.023	0.030
Housing	0.180	0.124	0.235	0.130
Transport and Commu.	0.123	0.080	0.106	0.070
Household Effects	0.030	0.026	0.027	0.028
Personal Effects	0.049	0.043	0.047	0.042
Health Care	0.018	0.028	0.019	0.030
Education	0.026	0.011	0.029	0.010
Entertainment	0.018	0.012	0.019	0.009
Durables	0.061	0.073	0.042	0.042
Miscellaneous	0.177	0.284	0.148	0.269

different from each other in magnitude.²⁰ This implies that, for all practical purposes, one can simply rely on estimates without the 'community effects', i.e., assuming that all the households in the sample face the same price structure. The table also reveals that the expenditure shares of Clothing and Footwear, Fuel and Lighting, Household Effects, and Personal Effects are not considerably different between the urban and the rural sectors. For other commodities, however, the expenditure shares are considerably different between the two sectors.

In the second step, for households in different income groups within each sector, both linear as well as double-logarithmic functional forms of the Engel curve are estimated without the 'community effects'. The estimated marginal expenditure shares are reported in Table 4. The income-specific marginal expenditure shares of a majority of the commodities show considerable differences between the urban and the rural sectors. Furthermore, within each sector, the marginal expenditure shares

²⁰ Assuming that the covariance term between the coefficients is zero, the standard *t*-test was applied to test for the significance of the difference between the estimated coefficients. In almost all of the cases, the difference was found to be statistically insignificant at 95 percent.

Table 4
Marginal Expenditure Shares for Different Commodities, by Sector and Income Group

$$E_{ij}^{iq} = \alpha_{ij}^q + \beta_{ij}^q E_j^{iq} + \gamma_{ij}^q HS_j^{iq}$$

Commodities	Sectors	Income Groups					
		I ≤1000	II 1001-1500	III 1501-2000	IV 2001-3000	V 3001-5000	VI 5001-15000
Food and Drinks	Urban	0.264	0.329	0.210	0.279	0.252	0.191
	Rural	0.301	0.334	0.322	0.338	0.223	0.148
Clothing and Footwear	Urban	0.041	0.042	0.038	0.035	0.027	0.037
	Rural	0.039	0.045	0.046	0.043	0.023	0.025
Fuel and Lighting	Urban	0.023	0.036	0.030	0.025	0.016	0.019
	Rural	0.030	0.031	0.036	0.024	0.019	0.013
Housing	Urban	0.235	0.120	0.155	0.156	0.270	0.235
	Rural	0.130	0.216	0.104	0.099	0.196*	0.161
Transport and Commu.	Urban	0.106	0.033	0.056	0.068	0.065	0.120
	Rural	0.070	0.016	0.023	0.042	0.042	0.147
Household Effects	Urban	0.027	0.049	0.023	0.020	0.019	0.025
	Rural	0.028	0.025	0.030	0.035	0.018	0.014
Personal Effects	Urban	0.047	0.129	0.027	0.073	0.047	0.051
	Rural	0.042	0.027	0.053	0.053	0.027	0.023
Health Care	Urban	0.019	0.037	0.024	0.032	0.025	0.017
	Rural	0.030	0.037	0.031	0.042	0.021	0.039

Continued -

Table 4 - (Continued)

Commodities	Sectors	Overall	Income Groups					
			I ≤ 1000	II 1001-1500	III 1501-2000	IV 2001-3000	V 3001-5000	VI 5001-15000
Education	Urban	0.029	0.014	0.012	0.016	0.026	0.031	0.033
	Rural	0.010	0.003	0.012	0.015	0.012	0.007	0.010
Entertainment	Urban	0.019	0.011	0.008	0.008	0.012	0.011	0.020
	Rural	0.009	0.005	0.003	0.013	0.009	0.006*	0.012
Durables	Urban	0.042	0.008	0.015	0.186	0.030	0.036	0.061
	Rural	0.042	0.008	0.006	0.013	0.034	0.017	0.088*
Miscellaneous	Urban	0.148	0.131	0.188	0.224	0.240	0.195	0.163
	Rural	0.269	0.157	0.246	0.311	0.262	0.398	0.318

*Not Significant at 5 percent level of significance.

vary considerably across income groups. The pattern, however, is different for different commodities. It can also be seen from the table that the marginal expenditure share of Food and Drinks declines as we move from the lowest income group to the highest income group. For example, in the case of the urban sector, the marginal expenditure share declines from 0.407 for the lowest income group to 0.191 for the highest income group. Similarly, in the case of the rural sector, it declines from 0.348 to 0.148. Thus, the results reported in Table 4 provide abundant support for Engel's Curve.

The elasticities of different commodities with respect to total expenditure are reported in Table 5. It can be seen from the table that for the majority of the commodities the overall elasticities for the urban and the rural sectors are considerably different from each other. For instance, technically, Housing, Transport and Communication, Education, Entertainment, and Miscellaneous items are a luxury for the urban households, while in the case of the rural households, only Miscellaneous items are a luxury. Similarly, whereas the elasticities of Food and Drinks, Fuel and Lighting, Household Effects, Health Care, and Durables are relatively higher for the rural households as compared with those of the urban households, the opposite is true for Clothing and Footwear and Personal Effects.

It is interesting to note that for the majority of the commodities the elasticities with respect to total expenditure vary widely across different income groups. They, however, follow different patterns for different commodities. On the basis of their respective patterns, the commodities can be grouped into two broad categories: (i) those for which the expenditure elasticities first fall and then rise but may fall and rise again, and (ii) those for which the elasticities first rise and then fall but may rise and fall again. The first category includes commodities such as Food and Drinks, Clothing and Footwear, Fuel and Lighting, Housing, Personal Effects and Entertainment. The second category, on the other hand, includes Household Effects, Health Care, Education, and Miscellaneous items.

The cyclical pattern of the expenditure elasticities across income groups can be explained in terms of quantitative as well as qualitative changes in the households' consumption basket.²¹ For a given quality of a commodity, the immediate concern of a household is to consume that commodity upto a certain minimum desired level. If the households are not consuming the said commodity in the desired minimum amount, then the expenditure on that commodity increases with the increase in the level of income. Once the households have achieved that

²¹Deaton (1988) has also examined the issue of quality in consumers' choices by estimating price elasticities of the quality of various commodities. His approach, however, differs from ours in the sense that it takes unit values of consumers' purchases as the unit of observation, on the basis that consumers choose the quality of their purchases and the unit values reflect this choice.

Table 5
Expenditure Elasticities for Different Commodities, by Sector and Income Group

$$\ln E_{ij}^{Iq} = \theta_{ij}^q + \lambda_{ij}^q \ln E_{ij}^{Iq} + \delta_{ij}^q \ln HS_{ij}^{Iq}$$

Commodities	Sectors	Income Groups					
		I ≤1000	II 1001-1500	III 1501-2000	IV 2001-3000	V 3001-5000	VI 5001-15000
Food and Drinks	Overall	0.722	0.781	0.635	0.666	0.619	0.573
	Urban Rural	0.848	0.756	0.700	0.735	0.585	0.461
Clothing and Footwear	Overall	0.748	0.660	0.708	0.568	0.537	0.743
	Urban Rural	0.680	0.696	0.618	0.700	0.681	0.497
Fuel and Lighting	Overall	0.524	0.570	0.565	0.361	0.406	0.610
	Urban Rural	0.572	0.600	0.610	0.433	0.471	0.305
Housing	Overall	1.192	0.954	1.215**	1.060**	1.309	1.124**
	Urban Rural	0.843	0.823	0.883	0.801	0.812	0.802
Transport and Commu.	Overall	1.511	1.184**	1.191**	1.291**	1.362	1.683
	Urban Rural	1.027**	0.888	0.917	0.863	1.047**	1.190**
Household Effects	Overall	0.757	0.749	0.631	0.570	0.638	0.793
	Urban Rural	0.842	0.867	0.832	0.896	0.641	0.628
Personal Effects	Overall	0.985	0.977	0.766	1.016**	0.880	0.834
	Urban Rural	0.970	0.847	0.901	0.918	0.636	0.581
Health Care	Overall	0.773	0.892	0.910	0.830	0.930	0.882
	Urban Rural	0.866	1.129	0.762	0.916	0.853	0.739

Continued -

Table 5 - (Continued)

Education	Urban	1.247	1.127**	1.315**	1.377**	1.203**	1.365	1.105**
	Rural	0.698	0.469	0.772	0.851	0.689	0.776	0.569**
Entertainment	Urban	1.360	1.349	1.187**	1.245**	1.059**	1.044**	1.273
	Rural	0.977	1.064**	1.023**	1.844	0.836	0.728	1.069**
Durables	Urban	0.873	-0.028*	0.500*	1.440**	0.790	1.006**	1.627
	Rural	0.886	0.905	0.178*	-0.024	0.750	0.656*	1.180**
Miscellaneous	Urban	1.581	1.660	1.988	1.595	1.754	1.500	1.486
	Rural	1.787	1.727	1.808	1.935	1.815	1.674	1.643

*Not significant at 5 percent level of significance.

**Not significantly greater than unity at 5 percent.

desired level, then given the quality of the commodity, the share of the commodity in total expenditure declines as income increases. However, as income continues to increase, households switch to a better quality of the commodity and, thus, expenditure on the commodity starts increasing again. This pattern is repeated as income continues to increase even further because of the fact that there is no such thing as the 'best' quality of any commodity. In other words, as long as there is a better quality available, the cycle will be repeated.

The first category, i.e., for which expenditure elasticities first decline, includes commodities which are generally termed as the necessities and are likely to be consumed in the desired minimum amount. The initial decline in the elasticity indicates that for a given quality, the expenditure on these commodities follows a pattern as stipulated by Engel's law. However, as income continues to increase, the households switch to a better quality and, thus, we get a different pattern. The second category includes commodities which are not necessarily necessities and the households, to start with, may not be consuming them in the desired minimum amount. Thus, the initial rise in the elasticity of these commodities in response to an increase in the level of income reflects, for a given quality, the households' desire to first consume these commodities in the desired minimum amount. As a result, expenditure on these commodities increases.

On the basis of the estimates presented, it can be argued that the households in different income groups exhibit different consumption patterns, and that, in general, they alter their consumption bundle both quantitatively and qualitatively in response to the changes in income. This information is lost if one analyses the households' consumption patterns, using grouped data.

The expenditure elasticities obtained in some of the earlier studies, using grouped data and based on double-logarithmic form of the Engel curve, are reported in Table 6. The comparison of the elasticities should be viewed with some reservations because not only the period of the data differs but also the type of expenditure included in different commodity groups may differ. The comparison, however, reveals that while it is difficult to define any pattern, the estimates based on the grouped data are, in general, considerably different from the ones reported in this study using household level data. Perhaps even a more important aspect of using the micro data is that it enables us to focus on some target income groups.

The expenditure elasticities of different commodities with respect to the household-size are reported in Table 7. The elasticities of Food and Drinks, Clothing and Footwear, Fuel and Lighting, Household Effects, Personal Effects, Health Care, and Education are positive for both the urban and the rural sectors, as well as for households in different income groups within each sector. This indicates that for these commodities the 'specific effect' dominates the 'income effect'. The magnitude of the coefficient is less than unity, confirming the existence of

Table 6
Inter-study Comparison of Elasticity Estimates

Commodity Groups	Rahman (1963) 1959-60		Bussink ^a (1970) 1963-64		Ali (1981) 1971-72		Malik (1982) 1971-72		Siddiqui (1982) 1971-72		Malik and Ahmed (1985) 1979		Burney and Khan (1991) 1984-85	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Food and Drinks	0.96	0.63	0.63	0.63	0.64	0.64	0.82	0.87	0.65	0.71	0.83	0.86	0.72	0.78
Clothing and Footwear	0.72 (0.67)	1.00	0.68	0.73	0.54 (0.62)	0.54 (0.41)	0.86	0.85	0.75	0.94	0.90	0.90	0.75	0.68
Fuel and Lighting	-	0.49	0.28	0.48	0.51	0.51	0.70	0.76	0.60	0.64	0.63	0.69	0.53	0.62
Housing	-	0.96	0.73	1.11	1.10	1.10	1.13*	1.25*	1.43	1.27	1.19*	0.93*	1.19	0.84
Transport and Commu.	-	1.17	0.81	2.24	1.20	1.20	-	-	-	-	-	-	1.42	1.03
Household Effects	-	1.78	1.38	1.35**	1.51**	1.51**	1.27**	1.38**	-	-	1.26**	1.40**	0.74	0.83
Personal Effects	-	0.85	0.50	1.01	0.61	0.61	1.16	1.04	-	-	1.60	1.64	0.98	0.97
Health Care	-	1.22	1.24	0.77	0.67	0.67	-	-	-	-	-	-	0.77	0.86
Education	-	1.93	1.72	2.05	2.77	2.77	-	-	-	-	-	-	1.24	0.71
Entertainment	-	1.56	1.96	-	-	-	-	-	-	-	-	-	1.34	1.01
Durables	-	-	-	-	-	-	-	-	-	-	-	-	0.90	0.95
Miscellaneous	-	1.90	1.96	-	-	-	1.37	1.27	1.41	1.47	1.32	1.39	1.57	1.78

^a = Income Elasticities, * = House rent, ** = Furniture and Utensils.

Note: Years below the author's name refer to year of the data used in the study.

Table 7
Household-size Elasticities for Different Commodities, by Sector and Income Group

Commodities	Sectors	Income Groups					
		I ≤ 1000	II 1001-1500	III 1501-2000	IV 2001-3000	V 3001-5000	VI 5001-15000
Food and Drinks	Urban	0.198	0.149	0.194	0.228	0.288	0.307
	Rural	0.159	0.142	0.152	0.191	0.248	0.364
Clothing and Footwear	Urban	0.276	0.254	0.227	0.299	0.269	0.291
	Rural	0.313	0.291	0.338	0.394	0.492	0.636
Fuel and Lighting	Urban	0.262	0.282	0.255	0.238	0.216	0.191
	Rural	0.106	0.052	0.049*	0.084	0.141	0.231
Housing	Urban	-0.221	-0.158	-0.243	-0.216	-0.281	-0.299
	Rural	-0.201	-0.229	-0.148	-0.095*	0.027*	-0.041*
Transport and Commu.	Urban	-0.446	-0.416	-0.454	-0.871	-0.342	-0.424
	Rural	-0.246	-0.229	-0.172	-0.293	-0.134*	-0.167*
Housing Effects	Urban	0.247	0.319	0.209	0.254	0.200	0.030*
	Rural	0.105	-0.345	0.079*	0.119	0.274	0.171*
Personal Effects	Urban	0.058	0.034*	0.091	0.069	0.035*	0.129
	Rural	0.035	0.048*	-0.006*	-0.059*	0.274	0.016*
Health Care	Urban	0.122	0.178	0.191	0.030*	0.092*	0.294
	Rural	0.034*	-0.024*	0.156	0.019*	0.318	0.142*
Education	Urban	0.075*	0.224*	0.068*	-0.062*	-0.101*	0.091*
	Rural	0.193	0.036*	0.059*	0.0175*	0.125*	1.006

Continued -

Table 7 - (Continued)

Entertainment	Urban	-0.480	-0.658	-0.486	-0.416	-0.478	-0.415	-0.397
	Rural	-0.491	-0.738	0.239	-0.600	-0.064*	-0.368	0.289*
Durables	Urban	-0.328	-0.556	-0.118*	-0.089*	-0.307*	-0.558	-0.144*
	Rural	-0.376	-0.444	-0.596	0.198*	-0.231*	-0.560*	-0.582
Miscellaneous	Urban	-0.303	-0.468	-0.365	-0.303	-0.298	-0.133*	-0.092
	Rural	-0.274	-0.136	-0.552	-0.466	-0.406	-0.306	-0.334

*Insignificant at 5 percent level of significance.

economies of scale in the consumption of these commodities as the household-size increases. Furthermore, it is to be noted that the value of the coefficients not only varies widely between the sectors but also across different income groups within each sector. This suggests that the degrees of economies of scale in consumption are not only different across commodities but are also different between sectors as well as across different income groups within each sector.

For commodities such as Housing, Transport and Communication, Entertainment, Durables, and Miscellaneous items, the elasticity with respect to the household-size is negative. This implies that an increase in the family size, holding income constant, makes the family poorer which, after increasing its expenditure on relatively necessary items, cannot but spend less on other commodities. Based on data for the year 1971-72, Ali (1981) and Siddiqui (1982) have also obtained the household-size elasticities for different commodities. Their estimates, although qualitatively similar to the ones reported in this study, are considerably greater. The evidence, i.e., the smaller households-size elasticities for 1984-85 as compared with the ones for the year 1971-72, however, appear to suggest that over time the degrees of the economies in scale in consumption have increased.

In order to establish whether the differences between the urban and the rural sectors' consumption patterns, as reflected by the differences in the marginal expenditure shares and expenditure elasticities for various commodities, represent structural and/or behavioural differences, the data for the urban and the rural households in each income group are pooled and a combined regression is estimated with both additive and multiplicative dummy variables alongwith total expenditure and household-size as the explanatory variables.²² The dummy variable takes the value of '1' if the household belongs to the urban sector, and '0' otherwise. The signs of the dummy variables together with their levels of significance are reported in Table 8. It can be seen from the table that, in general, the sign of the additive dummy is negative and that of the multiplicative dummy is positive. This indicates that whereas, on average, the urban households spend proportionately less on the consumption of various commodities relative to the rural households, at the margin, however, they spend more. The table further reveals that the additive and the multiplicative dummies are significant for a majority of the commodities, particularly in the case of the low income households. Overall, the evidence, i.e., the significance of the additive as well as the multiplicative dummies, indicates that the observed differences in the estimated parameters for the urban and the rural households represent structural as well as behavioural differences in the consumption patterns between the two sectors.

²²The estimated coefficients are not reported in the paper. They are, however, available with the authors and can be supplied on request.

Table 8
Structural and Behavioural Differences between the Urban and the Rural Households in
Different Income Groups

Income Groups	I ≤ 1000		II 1001-1500		III 1501-2000		IV 2001-3000		V 3001-5000		VI 5001-15000	
	Additive Dummy	plicative Dummy	Additive Dummy	plicative Dummy	Additive Dummy	plicative Dummy	Additive Dummy	plicative Dummy	Additive Dummy	plicative Dummy	Additive Dummy	plicative Dummy
Food and Drinks	-*	++	-	++	-*	+	+	-*	-*	+	-	++
Footwear and Clothing	-*	+	-	+	-	+	-	-	+	+	-	+
Fuel and Lighting	-*	++	-*	+	-	-	-	-	-	-	-	+
Housing	++	-*	++	++	++	+	+	++	++	++	+	++
Transport and Commu.	-*	++	-*	++	++	-*	-*	++	++	++	+	-
Household Effects	-*	+	-*	+	-	++	++	-*	+	+	-*	+
Personal Effects	-*	++	-*	++	-*	-*	++	++	++	++	-*	++
Health Care	++	-*	-	+	-	+	+	-	-	+	+	-*
Education	-*	++	+	+	+	-	++	++	++	++	-	++
Entertainment	-*	++	-	++	-*	+	+	+	+	+	+	+
Durables	-	+	-*	++	++	-*	-	-	+	+	+	-
Miscellaneous	++	-*	+	+	-*	-	-	++	++	++	+	-*

*Significant at 5 percent level (2 tail test).

V. CONCLUSIONS

The purpose of this paper has been to analyze the consumption patterns in the urban and the rural sectors of Pakistan, using the household level data of 1984-85. The results reported in the paper indicate that there is not much difference between the estimates obtained with the 'community effects' and those obtained without it. The results presented are relatively more useful as compared to those reported in the earlier studies because, unlike the grouped data which, at best, yields average expenditure shares and expenditure elasticities, they provide income-specific expenditure shares and expenditure elasticities.

The results indicate that as the level of income increases, the share of Food and Drinks in total household expenditure declines for households in both the urban and the rural sectors. This finding is in complete conformity with Engel's law. The expenditure share of Transport and Communication is found to rise with the level of income, while that of Clothing and Footwear and Fuel and Lighting declines in the case of rural households.

The results further indicate that the expenditure elasticity of Food and Drinks is less than unity in both the urban and the rural sectors as well as for households in different income groups within each sector. Furthermore, it has a tendency to decline with the level of income. The expenditure elasticities of other commodities not only vary widely across different income groups within each sector, but they also exhibit a cyclical pattern. This information is lost if one analyses the consumption patterns by using grouped data.

The expenditure elasticities of different commodities with respect to the household-size confirm the existence of economies of scale in the consumption of a majority of the commodities considered in this paper. The results further suggest that the degrees of economies of scale not only differ across commodities but are also different across sectors, as well as across different income groups within each sector. Finally, the results of this study indicate that the observed differences in the consumption patterns of the urban and the rural households represent structural as well as behavioural differences.

When planning for future development, to raise the supply of different commodities, it is essential that future levels of demand are accurately predicted. Since priorities and investment targets have to be based on demand forecasts, among other things, reliable estimates of income/expenditure elasticities of different commodities are a pre-requisite. As the estimates presented in this study are based on recent household level data, it is believed that they are more likely to depict the true consumption patterns accurately. In particular, the income-specific estimates are likely to provide a better understanding of the changes in the consumption patterns by enabling policy-makers to focus on households in different income groups within the urban and the rural sectors.

REFERENCES

- Aasness, J., and Asbjørh Rodseth (1983) Engel Curves and Systems of Demand Functions. *European Economic Review* 20 : 1-3 95-121.
- Ahmad, Ehtisham, and S. Ludlow (1987) Aggregate and Regional Demand Response Pattern in Pakistan. *The Pakistan Development Review* 26 : 4 645-655.
- Ahmad, Ehtisham, S. Ludlow, and N. Stern (1988) Demand Responses in Pakistan: A Modification of the Linear Expenditure System for 1976. *The Pakistan Development Review* 27 : 3 293-308.
- Alderman, H. (1986) The Effects of Income and Food Price Changes on the Acquisition of Food by Low Income Households. Washington, D.C.: International Food Policy Research Institute. (Mimeographed)
- Alderman, H. (1988) Estimates of Consumer Price Response in Pakistan Using Market Price as Data. *The Pakistan Development Review* 27 : 2 89-107.
- Ali, M. Shaukat (1981) Rural-Urban Consumption Patterns in Pakistan. *Pakistan Economic and Social Review* 19 : 2 85-94.
- Ali, M. Shaukat (1985) Household Consumption and Saving Behaviour in Pakistan: An Application of the Extended Linear Expenditure System. *The Pakistan Development Review* 24 : 1 23-38.
- Behrman, J. R., and Anil B. Deolalikar (1990) The Intrahousehold Demand for Nutrients in Rural South India: Individual Estimates, Fixed Effects and Permanent Income. *Journal of Human Resource*.
- Bewley, R. A. (1982) On the Functional Form of Engel Curves: The Australian Household Expenditure Survey 1975-76. *The Economic Record* 58 : 160 82-91.
- Brown, Alan, and Angus S. Deaton (1972) Surveys in Applied Economics: Models of Consumer Behaviour. *The Economic Journal* 82 : 328 1145-1236.
- Burney, Nadeem A., and Ashfaq H. Khan (1991) Household-size, its Composition, and Consumption Patterns in Pakistan: An Empirical Analysis Using Micro Data. Islamabad: Pakistan Institute of Development Economics. (Mimeographed)
- Bussink, W. C. F. (1970) A Complete Set of Consumption Coefficients for West Pakistan. *The Pakistan Development Review* 10 : 2 193-231.
- Cheema, A. A., and M. H. Malik (1985) Changes in Consumption Patterns and Employment under Alternative Income Distribution in Pakistan. *The Pakistan Development Review* 24 : 1 1-22.
- Crockett, J. (1967) Consumer Expenditure and Income in Greece. Athens: Centre of Planning and Economic Research. (Research Monograph Series No. 17)
- Deaton, Angus S. (1988) Quality, Quantity, and Spatial Variation of Price. *American Economic Review* 78 : 3 418-430.
- Deaton, Angus S., and J. Muellbauer (1980) *Economic and Consumer Behaviour*. Cambridge: Cambridge University Press.

- Friedman, Milton (1957) *A Theory of Consumption Function*. Princeton, New Jersey: Princeton University Press.
- Giles, D. E. A., and P. Hampton (1985) An Engel Curve Analysis of Household Expenditure in New Zealand. *The Economic Record* 61.
- Houthakker, H. S. (1957) An International Comparison of Household Expenditure Pattern, Commemorating the Century of Engel's Law. *Econometrica* 25 : 1-4 532-551.
- Humphery, D. H., and H. S. Oxley (1976) Expenditure and Household-size Elasticities in Malawi: Urban-Rural Comparison, Demand Projections and Survey of East African Findings. *Journal of Development Studies* 12 : 2 252-269.
- Johnson, S. R., Z. A. Hussain, and R. D. Green (1984) *Demand System Estimation: Methods and Applications*. Ames: The Iowa State University Press.
- Johnston, J. (1986) *Econometric Methods*. Singapore: McGraw-Hill.
- Khan, M. I. (1970) Demand for Food in Pakistan in 1975. *The Pakistan Development Review* 10 : 3 310-333.
- Lipton, Michael (1988) The Poor and the Poorest: Some Interim Findings. Washington, D. C.: The World Bank. (Mimeographed)
- Malik, Shahnawaz (1982) Analysis of Consumption Pattern in Pakistan. *Pakistan Economic and Social Review* 20 : 2 108-122.
- Malik, Shahnawaz, and Rafiq Ahmad (1985) Analysis of Consumption Pattern in Pakistan. *Government College Economic Journal* 18 : 1 & 2 97-106.
- Malik, S. J., K. Abbas, and E. Ghani (1987) Rural-Urban Differences and the Stability of Consumption Behaviour: An Inter-temporal Analysis of the Household Income and Expenditure Survey Data for the Period 1963-64 to 1984-85. *The Pakistan Development Review* 26 : 4 673-682.
- Malik, S. J., M. Mushtaq, and E. Ghani (1988) Consumption Patterns of Major Food Items in Pakistan: Provincial, Sectoral and Inter-temporal Differences 1979 to 1984-85. *The Pakistan Development Review* 27 : 4 751-761.
- Mukhtar, Hanid (1985) Essays in Consumer Behaviour: Evidence from Pakistan. Unpublished Ph.D. Dissertation, Boston University, U.S.A.
- Prais, S. J., and H. S. Houthakker (1955) *The Analysis of Family Budget*. Cambridge: Cambridge University Press.
- Rahman, A. N. M. A. (1963) Expenditure Elasticities in Rural West Pakistan. *The Pakistan Development Review* 3 : 2 232-249.
- Ranis, G. (1961) Consumer Expenditure and Consumption Function. Islamabad: Pakistan Institute of Development Economics. (Monograph No. 6)
- Siddiqui, Rehana (1982) An Analysis of Consumption Patterns in Pakistan. *The Pakistan Development Review* 21 : 4 275-296.
- Stigler, G. J. (1954) The Early History of Empirical Studies of Consumer Behaviour.

Journal of Political Economy 62 : 2 95–113.

Tansel, Aysit (1986) An Engel Curve Analysis of Household Expenditure in Turkey 1978-79. *METU Studies in Development* 13 : 3-4 239–257.

Thomas, Duncan (1986) The Food Share as a Welfare Measure. Unpublished Ph.D. Dissertation. Princeton University, Princeton, New Jersey, U.S.A.

White, H. (1980) Using Least Squares to Approximate Unknown Regression Function. *International Economic Review* 21 : 1 149–170.

White, H. (1982) Maximum Likelihood Estimation of Misspecified Models. *Econometrica* 50 : 1 1–26.